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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/513,117	02/25/2000	Keisuke Yamato-Shi	35.C14302	6628

5514 7590 12/09/2002

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EXAMINER

HODGES, MATTHEW P

ART UNIT PAPER NUMBER

2879

DATE MAILED: 12/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/513,117

Applicant(s)

YAMATO-SHI ET AL.

Examiner

Matt P Hodges

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☒ Claim(s) 12-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 16.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____. \
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Response to Amendment

The Amendment, filed on 06/13/2002, has been entered and acknowledged by the Examiner.

Addition of claims 12-17 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki et al. (US 5,196,366).

Regarding claim 15, Yamazaki discloses (see figure 4a) a light-emitting device including diamond crystals (2), a substrate (1), and an electrode (7) electrically connected to the diamond layer. The diamond layer is chiefly composed of carbon but is doped with sulfur. (Column 5 lines 13-36).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Nomura et al. (US 5,470,265).

Regarding Claims 16 and 17, Yamazaki discloses the electron emitting device as discloses in the rejection of 15 above and further states that the individual devices can be combined on a substrate or individually separated as is known in the art depending on the application. (Column 6 lines 65-70). Yamazaki also discloses the use of phosphors in the diamond film. (Column 5 lines 25-28). It is known in the art to use individual electron emitters in an array to form an image making apparatus or to increase the light output of the device. Nomura discloses (see figure 3) the use of several electron-emitting elements to form an electron source. Wiring elements (27) are used to connect the individual electron emitting elements along with wiring electrodes (25). (Column 2 lines 50-58). Thus it would have been obvious to use the electron emitting elements disclosed by Yamazaki to form a electron emitting source as taught by Nomura since such a combination is well known in the art.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Dearnaley et al. (US 6,410,144).

Regarding Claim 12, Yamazaki discloses the electron emitting device as discloses in the rejection of 15 but does not specifically state the use of sulfur in concentrations above 1% mol as compared to carbon. However Dearnaley, in the same field of diamond films containing sulfur, discloses the use of 27% sulfur to carbon by weight in order to provide a more durable surface. (Column 3 lines 24-28). Thus, it would have been obvious at the time the invention was made to

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a person having ordinary skills in the art to incorporate sulfur in concentrations of 27% by weight into the electron emitting elements disclosed by Yamazaki to form an electron-emitting element that is advantageously more durable.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Dearnaley et al. (US 6,410,144) in further in view of Nomura et al. (US 5,470,265).

Regarding Claims 16 and 17, Yamazaki in view of Dearnaley discloses the electron emitting device as discloses in the rejection of claim 12 above and further states that the individual devices can be combined on a substrate or individually separated as is known in the art depending on the application. (Column 6 lines 65-70). Yamazaki also discloses the use of phosphors in the diamond film. (Column 5 lines 25-28). It is known in the art to use individual electron emitters in an array to form an image making apparatus or to increase the light output of the device. Nomura discloses (see figure 3) the use of several electron-emitting elements to form an electron source. Wiring elements (27) are used to connect the individual electron emitting elements along with wiring electrodes (25). (Column 2 lines 50-58). Thus it would have been obvious to use the electron emitting elements disclosed by Yamazaki to form a electron emitting source as taught by Nomura since such a combination is well known in the art.

Allowable Subject Matter

Claims 1-11 are allowed.

The following is an examiner's statement of reasons for allowance:

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Regarding claims 1-2 and 5-9, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claims 1-2 and 5-9, and specifically comprising the limitation of containing sulfur in the film in a range of not less than 1 mol% and not more than 5 mol% as a ratio to carbon.

Regarding claims 3-4 and 10-11, claims 3-4 and 10-11 are allowable for the reasons given in claims 1-2 and 5-9 because of their dependency status from claims 1-2 and 5-9.

Other Prior Art Cited

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nomura et al. (US 5,578,897) discloses use of an electron source comprising a number of electron sources.

Nishimura et al. (US 6,208,071) discloses the use of electron sources and combinations of those sources to form a system of electron sources.

Nakagawa et al. (US 4,766,477) discloses the use of a carbon and sulfur film for use in semiconductor devices such as thin film transistors.

Contact Information

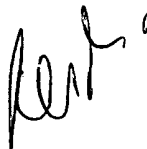
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matt P Hodges whose telephone number is (703) 305-4015. The examiner can normally be reached on 7:30 AM to 4:00 PM M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

mph 
December 2, 2002


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